IRON AND STEEL

By Michael D. Fenton

Domestic survey data and tables were prepared by Sirirat Harris, statistical assistant, and the world production tables were prepared by Linder Roberts (pig iron) and Glenn J. Wallace (steel), international data coordinators.

The gradual recovery in the global economy, beginning in late 2003, continued through 2004 (International Iron and Steel Institute, 2004b§[1]). The United Nations reported that the world's recovering economy had an estimated growth of 3.5% for 2004, led by the United States but significantly influenced by China (United Nations, 2004§). The recovery was broad based and encompassed all regions of the world. One part of the recovery was the relatively rapid growth of world trade, an estimated 7.5% in 2004, up from 4.8% in 2003.

The United States continued to be the world's leading economy, having a gross domestic product (GDP) of about $11.7 trillion (World Bank, The, 2005§). This is 2.5 times greater than that of the second ranked economy, Japan, and seven times larger than that of China. U.S. apparent steel consumption, an indicator of economic growth, increased to 117 million metric tons (Mt) in 2004 from 107 Mt in 2003, nearly reaching the peak of 120 Mt in 2000.

The formation of Mittal Steel Co. and the announced buyout of International Steel Group, Inc., in 2004 made Mittal the leading steel company in the world valued at $17.8 billion, having capacity of 58 million metric tons per year (Mt/yr) and projected revenues of $32 billion per year. Mittal's North American steelmaking capacity is in 21 mills, 17 of which are in the United States. Mittal is seen by many as signifying the future of the world steel industry, which is international consolidations resulting in several very large, high-capacity companies offering a wide range of products and having global buying power and raw materials security.

World raw steel production by the 62 countries reporting to the International Iron and Steel Institute (IISI) has shown remarkable growth as it exceeded 1 billion metric tons (Gt) in 2004 for the first time in history and was almost 9% higher than the previous year (American Metal Market, 2005b).

The American Iron and Steel Institute (AISI) reports U.S. production of iron and steel and shipments of steel mill products. These data can be regarded as representing 100% of the raw steel producers in the United States. World production of iron and steel is reported by the IISI and by foreign government agencies. Consistent with international usage and Federal Government policy, the U.S. Geological Survey reported all data on iron and steel in metric units unless otherwise noted.

Environment

The Attorney General of New Jersey joined the U.S. Environmental Protection Agency (EPA) in an attempt to close a South Plainfield, NJ, scrap metal recycler that has failed to meet State environmental compliance regulations since the 1980s (McCann, 2004). In Michigan, the city of River Rouge is suing U.S. Steel Corp. over alleged air pollution from the steelmaker's plant south of Detroit (Sacco, 2004a). The Great Lakes Works on the Detroit River was cited by the Michigan Department of Environmental Quality at least seven times in 2004 for environmental violations. Air testing found such pollutants as benzene, chromium, copper, lead, manganese, and zinc from the plant, according to the lawsuit. In Pennsylvania, the Allegheny Health Department issued three citations to U.S. Steel's Edgar Thomson plant in Braddock for releasing ash containing oxides of aluminum, calcium, iron, and magnesium into the air when slag was dumped into quenching pools (Sacco, 2004b). The company was also cited for releasing soot into the air and agreed to install pollution abatement equipment.

Tetra Tech, Inc. was awarded a 2-year $27 million contract from Qingdao Iron & Steel Group Co. Ltd. to manage the environmental issues, dismantlement, packaging, shipment, and reassembly of assets purchased from the bankruptcy estate of Geneva Steel. The plant, located in Orem, UT, will be moved to Qingdao, China.

Steel mills continue their vigil against accidental meltings of ferrous scrap containing radioactive materials. The amount of radioactive material reaching steel mills is said to be increasing, which has led to an expansion of the use of radiation detection equipment from steel mill portals to scrap yards (RADRisk Consulting, 2005§). A large contribution to radioactive contamination is thought to come from scrap metal imported from countries of the Commonwealth of Independent States (CIS). Owing to the mixing of scrap loads, the origin of contaminated scrap is often difficult to determine, and there is no obligation for the seller to state the origin of the scrap. Finished metal products were discovered in Russia in which scrap metal from the Chernobyl area had been used in fabrication. In April, the United Nations Economic Commission for Europe suggested that continuing international dialog could result in the establishment of a voluntary international protocol providing for a consistent and internationally harmonized approach to monitoring and response procedures (United Nations Economic Commission for Europe, 2004§). A contamination incident was reported from a steel plant in Pucheng, Shaanxi Province, China, where a canister of cesium-137 stolen from a powerplant building site was melted (English.eastday.com, 2004§). Apparently, local villagers stole the canister and sold it unopened to a recycling vendor as scrap metal who passed it to the mill. The mill was closed, its contaminated slag and billet were sealed, and people were barred from the mill because of the high radiation levels. To avoid such incidents in the United States, the EPA administers a program designed to regain control of radioactive devices used in industrial buildings, especially those scheduled for demolition, including instruments used for precise measurements in production lines and some fire exit signs (PCT online.com, 2004§).

[1]References that include a section mark (§) are found in the Internet References Cited section.

The U.S. Maritime Administration (MARAD) is disposing of 70 obsolete ships, some of World War II vintage and considered floating environmental hazards, from the 94-ship James River Reserve Fleet near Fort Eustis, VA (Washington Times, The, 2003). Contracts awarded to International Shipbreaking, Ltd. will bring to 16 the number of ships removed for scrapping between August and December. Forty-three ships have been removed since January 2001 (U.S. Department of Transportation, 2005§).

Production

Production of raw steel in the United States increased to 99.7 Mt from 93.7 Mt in 2003 (table 1). The AISI estimated raw steel production capability to be 105 Mt, down from 110 Mt in 2003. Production represented 94.6% of estimated capacity compared with 84.9% in 2003.

Integrated steel producers smelted iron ores to liquid iron in blast furnaces and used basic oxygen furnaces to refine this iron with some scrap to produce raw liquid steel. The basic oxygen process was used to make 47.8 Mt of steel (American Iron and Steel Institute, 2004, p. 75). The use of this process declined slightly to 47.9% of total steel production in 2004 from 49.0% in 2003. The integrated steel industry in the United States consisted of 8 companies operating ironmaking and steelmaking facilities at 15 locations (Association for Iron & Steel Technology, 2004). Several of these companies also operated nonintegrated plants and/or other steelmaking facilities at the same locations.

Minimills and specialty mills are nonintegrated steel producers that use electric arc furnaces (EAF) to melt low-cost raw materials (usually scrap). They also employ continuous casting machines and hot-rolling mills that are often closely coupled to the casting operation. Specialty mills include producers of stainless, alloy-electrical, and tool steel; high-temperature alloys; forged ingots; and other low-volume steel products. The nonintegrated sector of the industry, about 72 companies operating about 105 steelmaking plants, used the EAF steelmaking process to produce 52.0 Mt of steel, an increase of about 8.7% compared with that of 2003, and accounted for 52.1% of total steelmaking (Iron and Steelmaker, 2003; American Iron and Steel Institute, 2004, p. 75).

Raw liquid steel is mostly cast into semifinished products in continuous casting machines. Only 2.9% of U.S. production was cast in ingot form and subsequently rolled into semifinished forms; this represented about the same as that of 2003. Continuous casting production was 96.8 Mt, or 97.1% of total steel production, compared with 91.1 Mt, or 97.3%, in 2003 (American Iron and Steel Institute, 2004, p. 75).

Consumption

Steel mill products are produced at a steel mill either by forging or rolling into forms normally delivered for fabrication or use. Some companies purchase semifinished steel mill products from other steel companies and use them to produce finished steel products. To avoid double counting steel mill product shipments under these circumstances, steel mills identify any shipments of steel mill products to other companies that are reporters of steel mill product shipments. The accumulated shipments of all companies less the shipments to other reporting companies are identified as net shipments.

The U.S. apparent consumption or supply of steel mill products was 117 Mt, a 9% increase above that in 2003. Shipments of steel mill products by U.S. companies increased by 5% to 101 Mt compared with those of 2003 (American Iron and Steel Institute, 2004, p. 31). Export shipments by AISI reporting companies decreased to 7.2 Mt from 7.5 Mt in 2003 (American Iron and Steel Institute, 2004, p. 42). Shipments to domestic customers increased by 5.6% during 2003 (American Iron and Steel Institute, 2004, p. 31). Shipments of construction and contractors' products, the single leading end-use market, decreased by 7.8%. Automotive product shipments increased by 4.3% in 2004. Lumbering, mining, oil and gas, and quarrying industries shipments decreased by nearly 16%. Shipments of industrial and agricultural machinery, equipment, and tools increased by more than 21%. Appliance shipments; containers, packaging, and shipping material shipments; and steel service center shipments, increased by more than 15%.

Prices

The U.S. Department of Labor, Bureau of Labor Statistics, producer price index for steel mill products was up by 34% to 147.2 from 109.5 in 2003 (1982 base=100) (table 1) (U.S. Department of Labor, Bureau of Labor Statistics, 2005§). The index increased steadily throughout the year from 115.4 in January to 166.7 in December.

Foreign Trade

Exports of steel mill products decreased to 7.2 Mt from 7.5 Mt in 2003 (American Iron and Steel Institute, 2004, p. 42). Canada received the largest amount of U.S. exported steel, 4.7 Mt, 20% more than in 2003. Mexico was again in second place, receiving 1.5 Mt, up from 1.4 Mt in 2003 (table 4). Imports of steel mill products increased by 55% to 32.5 Mt from 21.0 Mt in 2003 (American Iron and Steel Institute, 2004, p. 55). Brazil, Canada, China, the European Union (EU), Germany, Japan, Mexico, the Republic of Korea, Russia, and Turkey were major sources of steel mill product imports.

Several steel trade issues remained to be resolved by the end of 2004. The U.S. Department of Commerce (DOC) steel import licensing and monitoring system, supported by the Congressional Steel Caucus, was to be expanded and made permanent when the controversial section 201 steel import tariffs were cancelled by the administration (American Metal Market, 2005c). The DOC invited comments on an extension to begin after March 21, 2005. Canada and Mexico called on the United States to eliminate all antidumping and countervailing duty cases between the three countries in order to establish a truly free-trade zone (American Metal

Market, 2004a). The World Trade Organization authorized the EU, Brazil, Canada, Japan, and other countries to impose trade sanctions against the United States in response to a legislative amendment (known as the Byrd amendment) that allows U.S. companies to receive duties collected on dumped imports brought to the United States (American Metal Market, 2004b). Congress has considered repealing the amendment.

Imports of semifinished steel by steel companies must be taken into consideration in evaluating apparent consumption (supply) of steel mill products in the United States and the share of the market represented by imported steel. To avoid double counting the imported semifinished steel and the products produced from it, the amount of semifinished steel consumed by companies that also produced raw steel must be subtracted from domestic consumption. Between 1993 and 2003, semifinished steel imports were in a range between 2.5 and 7.3 Mt/yr (table 6). Prior to 1993, the amount was less than 0.2 Mt/yr. Taking the imported semifinished steel into consideration, the share of the U.S. steel market represented by imported steel was an estimated 28% in 2004 compared with 20% in 2003.

Regarding the reporting of imports and exports, "fabricated steel products" are produced from steel mill products but do not include products that incorporate steel products with other materials. Examples of fabricated steel products are fabricated structural steel and steel fasteners. "Other iron and steel products" refers to products that are not produced from steel mill products. Examples of other iron and steel products include iron or steel castings and direct reduced iron (DRI).

World Review

World production of pig iron totaled about 712 Mt, 7.2% more than that of 2003 (table 10). In Asia, China continued to be the leading producer of pig iron in the world, producing almost 252 Mt, 18% more than that of 2003. Japan, Russia, and the United States followed with 83 Mt, 50 Mt, and 42 Mt, respectively. The Republic of Korea's production increased slightly. Russia and Ukraine were the only major pig iron producers in the CIS. Production in Russia had increased by 12% since 2000 and was the highest in the past 5 years. During 2004, Ukrainian production continued a 7-year upward trend. In North America, the only major producer of pig iron was the United States, where production in 2004 increased by 4% above that in 2003. In South America, the only major pig iron producer was Brazil, producing more that 32 Mt. Germany was the top producer in the EU, producing about 30 Mt, slightly more than in that of 2003. India's production increased by about 4% above that of 2003.

World capacity for DRI production was estimated to be nearly 49 Mt/yr (Midrex Direct Reduction Corp., 2005). DRI production worldwide was about 75.3 Mt, a 66% increase from that of 2004. The leading producer of DRI was Venezuela, followed by, in descending order of tonnage, Iran, India, and Mexico (table 10). Production increases at existing ironmaking facilities during 2004 were caused by dramatic increases in the price of metallic iron, especially iron low in residual metals. Significant new capacity was contracted for additional iron making that is expected to come online in 2006-08. In 2004, additional DRI capacity of 0.8 Mt was under construction in the Republic of Korea. The leading technology was the Midrex process, followed by the HYL I and the HYL III processes.

World production of raw steel was 1,021 Mt, up from 971 Mt (revised) produced during 2003 (table 11). As in previous years, production varied widely among major regions of the world. Asian countries produced about 49% of the world's steel; the EU, 17%; and North America, 14%. During 2004, China was again the world's leading steel producer, exceeding 272 Mt, a gain of nearly 23% compared with that of 2003. In descending order, the leading producers behind China were Japan, the United States, Russia, the Republic of Korea, and Germany. These six countries accounted for 63% of world production. The combined steel production of the six steel-producing countries in the CIS was more than 107 Mt, about the same as that in 2003. Russia and Ukraine remained the top producers, continuing to increase production above the recent lows of 1998 (table 11).

Outlook

In 2004, the IISI revised its estimates for growth in global GDP as follows: 2.6% in 2003, 3.8% in 2004, and 3.4% for 2005 (International Iron and Steel Institute, 2004b§, c§). The Organisation for Economic Co-operation and Development (OECD) and the IISI forecast China's 2004 GDP to be 8.3% and 8.6% , respectively, and for 2005, 7.8% and 8.0%, respectively, after peaking at 9.1% in 2003. Other OECD projections for growth in GDPs in 2004 and 2005 are the EU, 2.1% and 2.6%; Japan, 3.0% and 2.8%; India, 6.8% and 6.0%; the Republic of Korea, 5.6% and 5.9%; Russia, 7.0% and 5.6%; and Turkey, 5.2% and 5.2%, respectively. Other IISI projections for growth in GDPs in 2004 and 2005 are EU, 2.3% and 2.4%; Japan, 4.4% and 2.0%; India, 7.5% and 8.0%; the Republic of Korea, 5.2% and 4.7%; Russia, 6.6% and 5.0%; and Turkey, 6.0% and 6.5%, respectively.

Global raw steelmaking capacity was expected to increase to more than 1,305 Mt/yr in 2006 from 1,184 Mt/yr in 2004 (International Iron and Steel Institute, 2004a§). Global consumption of finished steel products was 864 Mt in 2003, and projected to be 968 Mt (12% increase), 1,004 Mt (3.7% increase) and 1,053 Mt (4.9% increase) in 2004, 2005, and 2006, respectively (International Iron and Steel Institute, 2005§). The IISI expected demand to decline in several European countries and the United States in 2005 owing to slower economic growth, adjustments in steel inventories, and capacity additions in China, India, and other Asian economies (Steel Week, 2005; International Iron and Steel Institute, 2004a§). Demand in Brazil, India, and the Middle East, was forecast to grow by 9.4%, 6.4%, and 6.2%, respectively. Asian steel users, especially China, were expected by the OECD to consume 54% of world steel production in 2005 (American Metal Market, 2004a). The region was expected to account for 49% of world steel production, 31% of world steel exports, and 46% of world steel imports, according to the OECD.

Economic activity in China continued to be an important influence on the world economy and steel markets (International Iron and Steel Institute, 2004a§-c§). China is the fastest growing economy in the world, having a projected GDP growth of more than double that of any national economies, while being the world's leading steel producer and consumer. China's finished steel-product

consumption was expected to be 293 Mt, more than 10% of world consumption in 2005 and 9.2% in 2006. The IISI expected that China would account for 29% of total steel product demand and nearly 80% of world growth in 2005.

The U.S. steel industry was adversely affected by the Asian financial crisis of 1997 and the U.S. economic recession that began in early 2001. Between 1998 and early 2002, the industry was forced to file trade cases for relief from the flood of low-priced imports caused by substantial overcapacity among world steelmakers outside of North America. Meanwhile, electricity and natural gas costs were increasing significantly. More than one-third of all U.S. steelmaking capacity was in bankruptcy, and many mills closed (Sharkey, 2004§). As a result, there were company consolidations and restructuring during a brief period of temporary steel tariffs. The health of the industry began to improve by late 2003 as U.S. real economic growth reached near record levels and demand for steel and prices increased. Although during the short-term the end-use steel market will probably remain strong, it appears that consolidations and restructuring will continue as some steelmakers attempt to acquire ownership of raw material supplies (American Metal Market, 2004d, 2005a; Guzzo, 2005). Smaller steel companies that do not participate in consolidations may survive over the long term by establishing themselves in market niches and serving them well (Robertson, 2005).

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TABLE 1
SALIENT IRON AND STEEL STATISTICS[1]

(Thousand metric tons unless otherwise specified)

	2000	2001	2002	2003	2004
United States:					
Pig iron:					
Production[2]	47,900	42,100	40,200	40,600	42,300
Exports[3]	72	44	34	86	48
Imports for consumption[3]	4,970	4,370	4,620	3,890	6,400
Direct-reduced iron:					
Production[4]	1,560	120	470	210	180
Exports[3]	2	1	1	5	13
Imports for consumption[3]	1,090	1,650	2,010	1,940	2,450
Raw steel production:[5]					
Carbon steel	92,500	82,400	83,700	86,100	90,700
Stainless steel	2,190	1,820	2,180	2,220	2,400
All other alloy steel	7,510	5,920	5,680	5,350	6,560
Total	102,000	90,100	91,600	93,700	99,700
Capability utilization, percent	86.1	79.2	88.8	84.9	94.6
Steel mill products:					
Net shipments[2]	98,900	89,700	90,700	96,100	101,000
Exports[3]	5,920	5,570	5,450	7,460	7,200
Imports[3]	34,400	27,300	29,600	21,000	32,500
Producer price index (1982=100.0)[6]	108.4	101.3	104.8	109.5	147.2
World production:[7]					
Pig iron	573,000	585,000	610,000 r	664,000 r	712,000
Direct-reduced iron[4]	42,400	39,300	43,400	45,200 r	75,200
Raw steel	850,000	853,000 r	906,000	972,000 r	1,020,000

rRevised.

[1]Data are rounded to no more than three significant digits, except producers price index; may not add to totals shown.

[2]Data are from the American Iron and Steel Institute (AISI).

[3]Data are from the U.S. Census Bureau.

[4]Data are from Midrex Direct Reduction Corp., government, and companies.

[5]Raw steel is defined by AISI as steel in the first solid state after melting, suitable for rolling.

[6]Data are from the U.S. Department of Labor, Bureau of Labor Statistics.

[7]Data are from the U.S. Geological Survey and the International Iron and Steel Institute.

TABLE 2
MATERIALS CONSUMED IN BLAST FURNACES AND PIG IRON PRODUCED[1]

(Thousand metric tons)

Material	2003	2004
Iron oxides:[2]		
Ores	193	26
Pellets	50,400	54,900
Sinter[3]	8,850	7,900
Total	59,500	62,900
Scrap[4]	1,040	1,090
Coke[2]	15,400	15,100
Pig iron, produced	40,600	42,300

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]American Iron and Steel Institute.

[3]Includes sintered ore and pellet fines, dust, mill scale, and other revert iron-bearing materials; also some nodules.

[4]Mainly briquetted turnings and borings, shredded scrap, etc.; scrap produced at blast furnaces and remelt not included.

TABLE 3

DISTRIBUTION OF SHIPMENTS OF STEEL MILL PRODUCTS, BY STEEL TYPE, PRODUCT, AND MARKET[1]

	Quantity (thousand metric tons)		Percentage	
	2003	2004	2003	2004
Shipments by steel type:				
Carbon steel	90,100	94,700	93.69	93.76
Alloy steel	4,280	4,420	4.45	4.38
Stainless steel	1,790	1,880	1.86	1.86
Total	96,100	101,000	100.00	100.00
Steel mill products:				
Ingots, blooms, billets and slabs	1,440	976	1.49	0.97
Wire rods	3,150	2,350	3.28	2.32
Structural shapes, heavy	6,230	6,640	6.48	6.57
Steel piling	492	452	0.51	0.45
Plates, cut lengths	4,730	5,260	4.92	5.21
Plates, in coils	3,730	4,540	3.88	4.50
Rails	518	605	0.54	0.60
Railroad accessories	161	193	0.17	0.19
Bars, hot-rolled	5,840	6,560	6.08	6.49
Bars, light-shaped	1,220	1,390	1.27	1.37
Bars, reinforcing	7,380	7,340	7.68	7.27
Bars, cold finished	1,320	1,370	1.37	1.36
Tool steel	23	22	0.02	0.02
Pipe and tubing, standard pipe	1,070	1,070	1.11	1.06
Pipe and tubing, oil country goods	1,560	1,850	1.62	1.83
Pipe and tubing, line pipe	636	679	0.66	0.67
Pipe and tubing, mechanical tubing	706	1,010	0.73	1.00
Pipe and tubing, pressure tubing	17	39	0.02	0.04
Pipe and tubing, stainless	132	13	0.14	0.01
Pipe and tubing, structural	39	141	0.04	0.14
Pipe for piling	14	30	0.01	0.03
Wire	515	514	0.54	0.51
Tin mill products, blackplate	275	196	0.29	0.19
Tin mill products, tinplate	2,190	2,070	2.28	2.05
Tin mill products, tin-free steel	619	567	0.64	0.56
Tin mill products, tin coated sheets	103	114	0.11	0.11
Sheets, hot-rolled	19,900	20,600	20.71	20.39
Sheets, cold-rolled	12,300	13,400	12.76	13.25
Sheets and strip, hot dip galvanized	13,800	14,800	14.36	14.64
Sheets and strip, electrogalvanized	2,320	2,310	2.41	2.28
Sheets and strip, other metallic coated	1,780	2,020	1.85	1.99
Sheets and strip, electrical	380	403	0.40	0.40
Strip, hot rolled	63	50	0.07	0.05
Strip, cold rolled	1,510	1,480	1.57	1.47
Total	96,100	101,000	100.00	100.00
Shipments by markets:				
Service centers and distributors	25,900	30,700	26.94	30.36
Construction	21,600	19,900	22.45	19.69
Automotive	14,400	15,000	14.99	14.88
Machinery	1,070	1,300	1.11	1.29
Containers	2,750	2,700	2.86	2.67
All others	30,400	31,400	31.66	31.12
Total	96,100	101,000	100.00	100.00

[1]Data are rounded to no more than three significant digits, except percentages; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 4

U.S. IMPORTS AND EXPORTS OF STEEL MILL PRODUCTS, BY COUNTRY[1]

(Thousand metric tons)

Country	2003		2004	
	Imports	Exports	Imports	Exports
Argentina	369	3	343	4
Australia	--	7	--	--
Brazil	1,940	12	3,070	22
Canada	4,830	3,910	4,960	4,680
China	583	692	1,680	118
European Union	3,510	645	5,020	230
Japan	933	13	1,280	10
Korea, Republic of	1,080	17	1,490	25
Mexico	2,920	1,430	3,880	1,540
Russia	295	--	2,180	--
South Africa	--	4	--	4
Sweden	170	1	212	2
Taiwan	173	71	801	37
Turkey	900	--	1,990	--
Ukraine	75	--	436	--
Venezuela	--	14	--	35
Other	3,210	637	5,150	489
Total	21,000	7,460	32,500	7,200

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 5
U.S. EXPORTS OF IRON AND STEEL PRODUCTS[1]

(Thousand metric tons)

	2003	2004
Steel mill products:		
Ingots, blooms, billets, slabs	211	258
Wire rods	77	91
Structural shapes, heavy	463	601
Steel piling	11	13
Plates, cut lengths	587	826
Plates, in coils	493	533
Rails, standard	29	59
Rails, other	21	23
Railroad accessories	20	26
Bars, hot-rolled	355	410
Bars, light-shaped	93	112
Bars, concrete reinforcing	254	224
Bars, cold-finished	113	131
Tool steel	14	19
Pipe and tubing, standard pipe	72	83
Pipe and tubing, oil country goods	266	285
Pipe and tubing, line pipe	124	150
Pipe and tubing, mechanical tubing	7	8
Pipe and tubing, stainless	35	33
Pipe and tubing, nonclassified	239	298
Pipe and tubing, structural	110	122
Pipe for piling	4	3
Wire	127	144
Tin mill products, blackplate	20	5
Tin mill products, tinplate	259	261
Tin mill products, tin-free steel	26	30
Sheets, hot-rolled	1,390	582
Sheets, cold-rolled	851	530
Sheets and strip, hot-dip galvanized	451	492
Sheets and strip, electrogalvanized	115	136
Sheets and strip, other metallic coated	129	136
Sheets and strip, electrical	101	122
Strip, hot-rolled	131	183
Strip, cold-rolled	259	266
Total	7,460	7,200
Fabricated steel products:		
Structural shapes, fabricated	201	233
Rails, used	36	28
Railroad products	25	58
Wire rope	10	12
Wire, stranded products	30	21
Wire, other products	21	23
Springs	79	99
Nails and staples	23	27
Fasteners	371	779
Chains and parts	25	26
Grinding balls	60	11
Pipe and tube fittings	36	34
Other[2]	46	57
Total	963	1,410
Grand total	8,420	8,600

See footnotes at end of table.

TABLE 5—Continued
U.S. EXPORTS OF IRON AND STEEL PRODUCTS[1]

(Thousand metric tons)

	2003	2004
Cast iron and steel products:		
Cast steel pipe fittings	36	34
Cast iron pipe and fittings	68	76
Cast steel rolls	13	17
Cast grinding balls	26	25
Granules, shot and grit	22	27
Other castings	41	55
Total	206	234

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes shapes cold formed, sashes and frames, fence and sign post, architectural and ornamental work, and conduit.

Source: American Iron and Steel Institute.

TABLE 6
U.S. IMPORTS OF MAJOR IRON AND STEEL PRODUCTS[1]

(Thousand metric tons)

	2003	2004
Steel mill products:		
Ingots, blooms, billets, and slabs	4,370	6,730
Wire rods	1,970	3,420
Structural shapes-heavy	496	564
Steel piling	91	107
Plates, cut lengths	514	814
Plates, in coils	503	1,060
Rails and railroad accessories	155	222
Bars, hot-rolled	1,390	1,580
Bars, light-shaped	179	226
Bars, reinforcing	924	1,740
Bars, cold-finished	246	307
Tool steel	163	163
Pipe and tubing, standard pipe	895	1,170
Pipe and tubing, oil country goods	688	1,010
Pipe and tubing, line pipe	859	992
Pipe and tubing, mechanical tubing	485	558
Pipe and tubing, pressure tubing	64	97
Pipe and tubing, stainless	86	108
Pipe and tubing, nonclassified	18	15
Pipe and tubing, structural	366	495
Pipe for piling	10	9
Wire	686	857
Tin mill products-blackplate	42	58
Tin mill products-tinplate	282	328
Tin mill products-tin-free steel	74	100
Sheets, hot-rolled	2,100	3,850
Sheets, cold-rolled	1,200	2,350
Sheets and strip, hot-dip galvanized	1,420	2,690
Sheets and strip, electrogalvanized	110	105
Sheets and strip, other metallic coated	282	425
Sheets and strip, electrical	73	79
Strip, hot-rolled	89	98
Strip, cold-rolled	147	160
Total	21,000	32,500
Fabricated steel products:		
Structural shapes, fabricated	620	614
Rails, used	207	131
Railroad products	87	126
Wire rope	114	124
Wire-stranded products	204	261
Springs	446	505
Nails and staples	728	928
Fasteners	1,140	1,370
Chains and parts	109	119
Pipe and tube fittings	136	161
Other	516	400
Total	4,300	4,740
Grand total	25,300	37,200
Cast iron and steel products:		
Cast steel pipe fittings	136	161
Cast iron pipe and fittings	44	54
Other products	365	396
Total	545	611

See footnotes at end of table.

TABLE 6—Continued
U.S. IMPORTS OF MAJOR IRON AND STEEL PRODUCTS[1]

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 7
U.S. IMPORTS OF STAINLESS STEEL[1]

(Metric tons)

Product	2003	2004
Semifinished	183,000	175,000
Plate	53,900	62,300
Sheet and strip	53,900	54,600
Bars and shapes	72,900	84,300
Wire and wire rods	66,900	75,700
Pipe and tube	95,200	108,000
Total	526,000	560,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 8
U.S. SHIPMENTS OF IRON AND STEEL CASTINGS[1]

(Thousand metric tons)

	2003	2004
Ductile iron castings	3,540	NA
Gray iron castings	3,830	NA
Malleable iron castings	104	NA
Steel castings	670	NA
Steel investment castings	58	NA
Total	8,200	NA

NA Not available.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 9
COAL AND COKE AT COKE PLANTS[1, 2]

(Thousand metric tons)

	2003	2004
Coal, consumption	22,000	21,500
Coke:[3]		
Production	15,600	15,300
Exports	655	1,200
Imports	2,500 [r]	6,230
Consumption, apparent	17,600	20,400

[r]Revised.

[1]Data are rounded to no more than three significant digits.

[2]Includes furnace and merchant coke plants.

[3]Coke production and consumption do not include breeze.

Source: Energy Information Administration, Quarterly Coal Report, DOE/EIA-0121(2001/4Q).

TABLE 10

PIG IRON AND DIRECT-REDUCED IRON: WORLD PRODUCTION, BY COUNTRY[1, 2, 3, 4]

(Thousand metric tons)

Country[5]	2000	2001	2002	2003	2004[e]
Albania[e]	10	10	10	10	10
Algeria[e]	1,100	1,250	1,300	1,300	1,300
Argentina:					
Pig iron	2,186	1,916	2,180 r	2,402 r	2,600
Direct-reduced iron	1,420	1,276	1,476 r	1,736 r	1,900
Australia[e]	7,000	7,200	7,300 6	7,300	7,300
Austria	4,318	4,300	4,300	4,300 e	4,300
Belgium	8,472	7,732	8,053	8,000 e	8,000
Bosnia and Herzegovina[e]	100	100	100	100	100
Brazil:					
Pig iron	27,952 r	27,623 r	29,899 r	32,500 r	32,500
Direct-reduced iron	418	400 e	400	400 e	400
Bulgaria	1,220	1,160	1,072	1,386 r	1,300
Burma:[e]					
Pig iron	2	2	2	2	2
Direct-reduced iron	40	40	40	40	40
Canada:					
Pig iron	8,900	8,780	8,800	8,800 e	8,800
Direct-reduced iron	920	920	920	920 e	920
Chile	1,024 r	897	934 r	988 r	1,000
China[7]	131,010	155,540	170,850	213,660 r	251,850 6
Colombia	272	349 r	311 r	283 r	300
Czech Republic	4,621	4,671	4,840	5,207 r	5,000
Egypt:					
Pig iron[e]	1,400	1,400	1,800	1,500	1,500
Direct-reduced iron	2,110	2,370	2,530	2,870	2,800
Finland	2,983	2,852	2,828	2,800	2,900
France	13,621	12,004	13,217	12,756 r	13,000
Germany:					
Pig iron	30,846	29,184	29,427 r	29,481 r	30,018 6
Direct-reduced iron	400 e	400	400	400 e	400
Hungary	1,340	1,226	1,335 r	1,333 r	1,350
India:					
Pig iron	21,321	21,900	24,315	24,000 r	25,000
Direct-reduced iron	5,440	5,590	5,731	5,800	5,800
Indonesia, direct-reduced iron[e]	1,820	1,480	1,500	1,230	1,470
Iran:					
Pig iron	2,202	2,300	2,400	2,300 e	2,700
Direct-reduced iron	4,740	5,000 e	5,280 e	5,620 e	6,410
Italy	11,223	10,650	9,736	10,000	10,000
Japan	81,071	78,836	80,979 r	82,092 r	82,974 6
Kazakhstan	4,000	3,907	4,089	4,140 e	4,400 6
Korea, North[e]	800	800	800	900 r	900 6
Korea, Republic of	24,937	25,898	26,570	27,314 r	28,000
Libya, direct-reduced iron	1,500 e	1,090	1,170	1,340 e	1,580
Malaysia, direct-reduced iron[e]	1,260	1,120	1,080	1,600 6	1,680
Mexico:					
Pig iron	4,856	4,373 r	3,996	4,183 r	4,278 6
Direct-reduced iron	5,589	3,672 r	4,741 r	5,473 r	6,345 6
Morocco[e]	15	15	15	15	15
Netherlands[8]	4,969	5,305	5,381	5,300 e	5,300
New Zealand[e]	600	600	600 6	600	600
Norway[e]	60	60	80	90 r	90
Pakistan[e]	1,500	1,500	1,500	1,500	1,500

See footnotes at end of table.

TABLE 10—Continued

PIG IRON AND DIRECT-REDUCED IRON: WORLD PRODUCTION, BY COUNTRY[1, 2, 3, 4]

(Thousand metric tons)

Country[5]	2000	2001	2002	2003	2004[e]
Paraguay	82	72 [r]	87 [r]	98 [r]	100
Peru:					
Pig iron	327	330	330	330 [e]	330
Direct-reduced iron	80	80	80	80 [e]	80
Poland	6,492	5,440	5,296	5,632 [r]	5,700
Portugal	382	82	--	--	--
Qatar, direct-reduced iron	620	730	750	780 [e]	830
Romania	3,069	3,243 [r]	3,979 [r]	4,101 [r]	4,000
Russia:					
Pig iron	44,618	44,980	46,060	48,368	50,000
Direct-reduced iron	1,920	2,510	2,910	2,900 [e]	3,100
Saudi Arabia, direct-reduced iron	3,090	2,880	3,290	3,290	31,410 [6]
Serbia and Montenegro	563	461	485	635 [r]	600
Slovakia	3,167	3,255	3,533 [r]	3,892 [r]	3,900
South Africa:					
Pig iron	6,292	5,820	5,823	5,891	6,200
Direct-reduced iron	1,530	1,556 [r]	1,702 [r]	1,542 [r]	1,630
Spain	4,059	4,094	3,978	4,000 [e]	4,000
Sweden	3,146	3,614	3,703	3,700 [e]	3,600
Switzerland[e]	100	100	100	100	600
Taiwan	9,971	10,316	10,524	10,799	10,198 [6]
Trinidad and Tobago, direct-reduced iron	1,530	2,186	2,316	2,275 [r]	2,300
Tunisia	196	192	152	36 [r]	--
Turkey	300	248	158	181 [r]	200
Ukraine	25,700	26,400	27,560	29,570	31,000 [6]
United Kingdom	10,891	9,861	8,579	8,561 [r]	10,200
United States:					
Pig iron	47,900	42,100	40,200	40,600	42,300 [6]
Direct-reduced iron	1,560	120	470	210	180 [6]
Venezuela, direct-reduced iron	6,401	5,903	6,824	6,645	6,800 [6]
Zimbabwe[e]	277	156	122	131	72
Grand total	616,000	624,000	653,000 [r]	708,000 [r]	788,000
Of which:					
Pig iron	573,000	585,000	610,000 [r]	663,000 [r]	712,000
Direct-reduced iron	42,400	39,300	43,600 [r]	45,200 [r]	76,100

[e]Estimated. [r]Revised. -- Zero.

[1]World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Production is pig iron unless otherwise specified.

[3]Direct-reduced iron is obtained from ore by reduction of oxides to metal without melting.

[4]Table excludes ferroalloy production except where otherwise noted. Table includes data available through August 10, 2005.

[5]In addition to the countries listed, Vietnam has facilities to produce pig iron and may have produced limited quantities during 2000-04, but output is not reported and available information is inadequate to make reliable estimates of output levels.

[6]Reported figure.

[7]Figures reported by the State Statistical Bureau that the Chinese Government considers as official statistical data.

[8]Includes blast furnace ferroalloys.

TABLE 11
RAW STEEL: WORLD PRODUCTION, BY COUNTRY[1, 2, 3]

(Thousand metric tons)

Country[4]	2000	2001	2002	2003	2004[e]
Albania[e]	65	94	100	100	100
Algeria	842	850	1,091	1,051	1,014 [5]
Argentina	4,472	4,107	4,363	5,033 [r]	5,125 [5]
Australia	7,812	7,600	8,242	8,300 [e]	4,811 [5]
Austria	5,725	5,887	6,208	6,261 [r]	6,530 [5]
Bangladesh[e, 6]	35	30	30	25	25
Belarus	1,623	1,500	1,500 [e]	1,570 [e]	1,600
Belgium	11,637	10,783	11,495	11,114 [r]	11,698 [5]
Bosnia and Herzegovina[e]	77	84	85	90	90
Brazil[7]	27,865	26,718	29,605	31,200 [r]	31,200
Bulgaria	2,017	1,942	1,860 [e]	1,900 [e]	1,900
Burma[e]	25 [r]	25 [r]	25 [r]	25 [r]	25
Canada	15,900	16,300	16,300	17,000 [r]	17,000
Chile[7]	1,352	1,247	1,279	1,377 [r]	1,370
China[8]	128,500	151,630	182,370	222,340 [r]	272,450 [5]
Colombia	660	638	664	668	745 [5]
Croatia	71	58	34	35 [e]	35
Cuba	327	270	264	268 [r, e]	268
Czech Republic	6,216	6,316	6,512	6,500 [e]	6,800
Denmark	803	746	392	-- [e]	--
Dominican Republic	36	33	61	61 [r, e]	61
Ecuador	58	60 [r]	69 [r]	80 [r]	80
Egypt	2,820 [e]	3,800	4,358	4,398 [r]	4,757 [5]
El Salvador	41	39	49	57	56
Finland	4,096	3,938	4,004	4,766	4,833 [5]
France	21,002	19,431	20,524	19,578 [r]	20,770 [5]
Georgia	(9)	--	--	--	--
Germany	46,376	44,775	44,999	44,809 [r]	46,374 [5]
Ghana, all from scrap	75	75	75	75	75
Greece	1,056	1,281	1,835	1,701 [r]	1,967 [5]
Guatemala	166	202 [r]	216 [r]	226 [r]	226
Hong Kong[e]	500	500	500	500	500
Hungary	1,871	2,056	2,141	2,100 [e]	2,000
India	26,924	27,291	28,814	31,779	32,000 [10]
Indonesia[e]	3,010	2,780	2,460	2,040 [r]	2,800
Iran	6,600	6,890	7,293	7,869	9,382 [5]
Iraq[e]	50	50	--	--	--
Ireland	375	110	--	-- [e]	--
Israel[e]	270	220	150	150	250
Italy	26,544	26,483	25,930	26,832 [r]	28,317 [5]
Japan	106,444	102,866	107,745 [r]	110,511 [r]	112,718 [5]
Jordan[e]	30	30	30	134 [r]	135
Kazakhstan	4,770	4,691	4,868	5,067	5,400
Korea, North[e]	1,000	1,000	1,030 [r]	1,090 [r]	1,070
Korea, Republic of	43,107 [r]	43,852 [r]	45,390 [r]	46,310 [r]	47,500
Latvia[e]	500	510 [e]	507 [r]	546 [r]	520
Libya	1,055	846 [e]	886	1,007 [r]	1,026 [5]
Luxembourg	2,571	2,725	2,736	2,675 [r]	2,684 [5]
Macedonia	161 [r]	218 [r]	225 [r]	291 [r]	300
Malaysia	3,650	4,100	4,722	3,960 [r]	4,100
Mauritania[e]	5 [5]	5	5	5	5
Mexico	15,631 [r]	13,300 [r]	14,010 [r]	15,159 [r]	16,730 [5]
Moldova	909	966	514	500 [e]	500
Morocco[e]	5	5	5	5	5

See footnotes at end of table.

TABLE 11—Continued
RAW STEEL: WORLD PRODUCTION, BY COUNTRY[1, 2, 3]

(Thousand metric tons)

Country[4]	2000	2001	2002	2003	2004[e]
Netherlands	5,667	6,037	6,144	6,571 [r]	6,848 [5]
New Zealand[e]	765 [5]	770	750	750	800
Norway	620	635	694 [e]	698 [e]	695
Pakistan[e]	500	500	500	500	500
Paraguay	77	71	80	91	95
Peru[e]	749 [5]	750	750	750	750
Philippines[e]	530	530	530	340	360
Poland	10,498	8,809	8,369	9,100 [r, e]	10,600
Portugal	1,060	728	800 [e]	722 [r]	720 [5]
Qatar	744	908	1,027	1,054	1,046 [5]
Romania	4,770	4,930	5,491	6,000 [r, e]	6,000
Russia	59,098	59,030	59,777	62,710	64,300
Saudi Arabia	2,973	3,413	3,570 [e]	3,944	3,902 [5]
Serbia and Montenegro	682	598	596	700 [e]	700
Singapore[e]	500	400	400	400	400
Slovakia	3,447	3,676	4,275	4,600 [r, e]	4,500
Slovenia	519	462	481 [e]	500 [e]	500
South Africa	8,481	8,821	9,095	9,481 [r]	9,504 [5]
Spain	15,920	16,500	16,358	16,287 [r]	17,684 [5]
Sri Lanka[e]	30	30	30	30	30
Sweden	5,227	5,518	5,754	5,707	5,949 [5]
Switzerland	1,140	1,000	1,000 [e]	1,000 [e]	1,000
Syria[e]	70	70	70	70	70
Taiwan	17,302	17,336	18,255	18,832 [r]	19,604 [5]
Thailand	2,100	2,127	2,538	3,572 [r]	3,600
Trinidad and Tobago	753	696	839	923 [r, e]	900
Tunisia	237	239	200 [e]	86 [e]	63 [5]
Turkey	14,325	14,382	16,046	18,298	20,478 [5]
Uganda[e]	7	7	7	7	7
Ukraine	31,780	33,110	34,538	36,900 [e]	38,740 [5]
United Arab Emirates[e]	70	70	70	50	50
United Kingdom	15,022	13,610	11,718	13,128 [r]	13,766 [5]
United States	102,000	90,100 [r]	91,600	93,700	99,700 [5, 10]
Uruguay	38	31	34	41	45
Uzbekistan	420	460	450 [e]	472 [e]	602 [5]
Venezuela	3,835	3,813	4,164	3,930	4,575 [5]
Vietnam	306	319	409	544 [r]	658 [5]
Zimbabwe[e]	258	149	105	152	150
Total	850,000	853,000 [r]	906,000	972,000 [r]	1,050,000 [10]

[e]Estimated. [r]Revised. -- Zero.

[1]World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Steel formed in solid state after melting, suitable for further processing or sale; for some countries, includes material reported as "liquid steel," presumably measured in the molten state prior to cooling in any specific form.

[3]Table includes data available through July 28, 2005.

[4]In addition to the countries listed, Mozambique is known to have steelmaking plants, but available information is inadequate to make reliable estimates of output levels.

[5]Reported figure.

[6]Data for year ending June 30 of that stated.

[7]Excludes castings.

[8]Figures reported by the State Statistical Bureau, which the Government of China considers to be official statistical data.

[9]Less than ½ unit.

[10]Corrections posted February 1, 2006, and February 17, 2006.